

Steps to Advance DR/Network Interconnections

*Presentation to February 15, 2006
Massachusetts DG Collaborative Plenary*

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This presentation and related material are posted at:
[http://www.masstech.org/renewableenergy/public_policy/
DG/meetings/2006_feb15_plenary.htm](http://www.masstech.org/renewableenergy/public_policy/DG/meetings/2006_feb15_plenary.htm)

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Collaborative Plenary

1

Purpose

- To advance the acceptability of DR on network service by encouraging changes in the network protector relays and in the DR controls to react instantaneously to required switching conditions utilizing communications between the protector relays and the DR controls.

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2

Approach

- Hold meetings with protector relay manufacturers, DR interface manufacturers, and utilities to determine what developments they feel are feasible and then, if warranted, prepare a plan for a prototype demonstration project

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3

Initial Steps

- Met with the DG Collaborative to outline our approach and request comments on our proposed effort. -----Done 01/25/06
- Meet with the DG Collaborative Plenary to present preliminary findings and seek comments. ---- February 15, 2006 Meeting

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Collaborative Plenary

4

Steps Taken

- Attended the meeting of the IEEE P1547.6 working group in Atlanta Georgia to determine their progress and direction in developing standards.
- Also, while in Atlanta, a meeting was held with one of the two protector relay manufacturers, and, with Georgia Power to discuss their methods for allowing interconnections on spot networks.
- Minutes posted on MTC Website:
http://www.masstech.org/renewableenergy/public_policy/DG/meetings/2006-01-31_Feero_Mtg-minutes.pdf

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5

Discussed with one Relay Manufacturer

- Points of concern expressed by many utilities are:
 1. The determination of abnormal system conditions and protection actions should be controlled and maintained by the utility.
 2. Adding intentional time delay to provide coordination time intervals between independently acting relays (utility's and DR's) may adversely impact the utility system.

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6

Discussed with one Relay Manufacturer- continued

- To alleviate these concerns, suggested possible solutions if network protector relaying with low reverse power time delayed settings were also capable of providing:
 - a. A means of computing the power import by each protector and sending a trip signal to the DR if the import dropped below a selectable level such as 6% of the transformer's rating. To prevent cycling of the DR, this relay would also have to have an over power setting to be exceeded before the DR could be connected online.

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Collaborative Plenary

7

Discussed with one Relay Manufacturer- continued

- b. For spot networks with more than two transformers, the above call for trip would have to be modified by some form of instantaneous acting AND circuit to only trip the DRs when more than 50% of the protectors were calling for a DR trip (note an open protector is in the under power region and therefore calling for a DR trip).

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8

Discussed with one Relay Manufacturer- continued

- c. For utilities who do not wish to set any intentional time delay, a network relay system that could issue a DR trip command and then trip itself, if required, after receiving a confirmation signal that the DR had tripped; a form of permissive tripping. This ability will also require some development by the DR manufacturers.

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9

Discussed with one Relay Manufacturer- continued

- d. A variation on item c. might be to block any network protector tripping if all network protector relays were calling for a trip. This would guard against dumping the network bus when DRs are operating and all the network relays call for a trip for utility system fault. (If the DRs were not online there would be no source to cause a reverse power flow.)

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10

Discussions with Three DR Manufacturers

- Discussed the concept of network protector relay centered control and the feasibility of receiving and sending trip communications between the network protector relay and the DR
- Asked for a preliminary expression of interest in being involved in any RFP that might be issued.
- Two interested in participating in a team
- One probably interested

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11

Next Steps

- Meet with other representative DR and inverter manufacturers to discuss their ideas and willingness to make changes that would enhance instantaneous interaction with the network protector relays

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12

Next Steps-continued

- Meet with the other relay manufacturer in New Jersey and meet with Con Ed to determine their ideas, approaches, and concerns that must be resolved.
- Contact other utilities such as PG&E, Excelon, SCE, and PSE&G by phone to discuss their application requirements and any concerns that need to be resolved.

Next Steps-continued

- Meet with NYSERDA in Albany, and hopefully by video conference with California, to present preliminary findings to the appropriate state agencies to enlist their support for funding any future RFPs that may result from this effort.
- Seek assurance from California that the DUIT Test Facility will be ready and available to act as a prototype test bed

Next Steps-continued

- Develop suggest Statement of Effort and meet with the Technical Network Working Group to seek comments on if and how to proceed. ----
March 15, 2006 Meeting
- If approved to proceed, assist in developing a draft statement of work to the state agencies that express an interest in co-funding in time for presentation to May Plenary Meeting

Discussion

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